

REMARKS

As an initial matter, Applicants acknowledge with appreciation the courtesies extended by Examiner Withers during the brief telephone interview conducted with Applicants' representative on January 11, 2008.

By this amendment, claims 1, 8, 10 and 11 have been amended and new claims 21-24 have been added. Support for the changes to independent claims 1 and 11 can be found, *inter alia*, at page 3, lines 2-10 and page 4, lines 6-12 of the specification. Claims 8 and 10 have been amended to correct minor typographical errors. Support for new claims 21 and 22 can be found in original claims 5 and 15, at page 9, line 2-11 of the specification, and in Figure 4. Support for new claims 23 and 24 can be found at page 9, lines 12-23 of the specification, and in Figure 5. Claims 1-24 are presented for further examination.

Regarding the Examiner's comments in paragraph 1 of the Office Action, Applicants understand that foreign patent document JP 2003-17687, which was cited in the Information Disclosure Statement filed October 3, 2005 (reference AF), was not indicated as having been considered because the Examiner believes that that the reference has no accompanying copy or English-language translation.

Applicants note that JP 2003-17687 (reference AF) was also published as WO 03/003471. WO 03/003471 was cited in the October 3, 2005 Information Disclosure Statement as reference AL, and was considered by the Examiner.

Because JP 2003-17687 (reference AF) was submitted together with an English-language abstract equivalent (WO 03/003471, reference AL), Applicants respectfully request that the Examiner return an initialed copy of the form PTO-1449 indicating that reference AF has been considered.

The requirement set forth in paragraph 2 of the Office Action that Applicants file a substitute specification is respectfully traversed. Applicants believe that the as-filed disclosure is readily understood and that the description of the invention is sufficiently clear to enable the Examiner to have made an examination on the merits. Reconsideration and withdrawal of the requirement are respectfully requested.

The rejection of claims 1-9 and 11-19 under 35 U.S.C. § 102(e) as being anticipated by Inoue, US 2004/0031985, and the rejection of claims 10 and 20 under 35 U.S.C. § 103(a) as being obvious over Inoue in view of the Angewandte Chemie article to Huppertz, are respectfully traversed with respect to the amended claims.

The invention relates to a semiconductor device and a method for making the device wherein a high-k gate insulation film is disposed between a silicon substrate and a gate electrode layer. As amended, independent claims 1 and 11 require that the gate insulation film is formed by performing a nitriding treatment on a precursor film that consists essentially of at least one metal and silicon. The resulting gate insulation film is a metal silicon nitride that may have one of the compositions set forth in claims 10 and 20. Notably, by

performing a nitriding treatment on a mixture of a metal and silicon, the formation of silicon dioxide between the substrate and the gate electrode layer can be prevented (see, e.g., page 3, line 6 through page 4, line 10 of the specification).

Inoue discloses a semiconductor device having a high-k nitride layer, but does not teach to prevent the formation of silicon dioxide. Pointedly, Inoue does not disclose or suggest forming a gate insulation film by nitriding a precursor film that consists essentially of at least one metal and silicon. Rather, Inoue forms a high permittivity nitride layer by nitriding either a metal oxide film 2, a polysilicon layer 14, or an amorphous silicon layer (see, e.g., paragraphs [0022], [0023], [0026], [0037] and [0038]). Inoue does not disclose or suggest any layer that is limited to a metal and silicon, much less the nitridation of such a layer to form a gate insulation film between a silicon substrate and a gate electrode layer.

Huppertz, which was cited merely for disclosing the gate insulation film compositions recited in claims 10 and 20, fails to remedy the deficiencies of Inoue with respect to independent claims 1 and 11. In view of the foregoing, reconsideration and withdrawal of the rejections are respectfully requested.

New claims 21 and 22 are deemed patentable based on their dependency from claims 1 and 11, as well as for the additional structural features recited therein. Notably, neither of the cited references discloses or suggests a transistor gate structure wherein a first silicon nitride film is formed as a barrier

layer between the silicon substrate and the gate insulation film, and a second silicon nitride film is disposed on the gate insulation film.

New independent claims 23 and 24 are deemed patentable at least for the reasons that independent claims 1 and 11 are patentable.

In view of the foregoing, the application is respectfully submitted to be in condition for allowance, and prompt favorable action thereon is earnestly solicited.

If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #010986.56896US).

Respectfully submitted,

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